Transitions of low educated

Edzes, A.J.E.; Hamersma, M.; Venhorst, V.A.; van Dijk, J.

Transitions of low educated graduates

Arjen Edzes[*]

Marije Hamersma[*]

Viktor Venhorst[*]

and

Jouke van Dijk[*]

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Abstract[**]

This paper deals with the question whether there is a significant impact of regional circumstances in explaining variations in transitions made by low educated school leavers. First we look at the choice between continuing education versus entering the labour market. Secondly we analyze the chance to get a job versus becoming unemployed. Finally we research the quality of the job in terms of wages of low educated young workers. Several explanatory regional circumstances are considered like urbanization and regional economic growth. The questions are analyzed using data of a schoolleaverssurvey in the period of 1996-2008 in the Netherlands. We find that regional factors have an impact on the decision to (not) continue education, the chance to get a job as well as on variation in wages of low educated graduates. However, they are not of main importance compared to other factors we take along.

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[*] University of Groningen, Faculty of Spatial Sciences, Department of Economic Geography, Urban and Regional Studies Institute (URSI), P.O. Box 800, NL-9700 AV Groningen, The Netherlands. Corresponding author: Arjen Edzes, tel. +31 50 363 8650; e-mail: a.j.e.edzes@rug.nl

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1. Introduction

Low educated school participants have a fundamental choice to make at a certain point in their school career: to continue education at a higher level or to exit and enter the labour market. From a micro level point of view both can be successful transitions dependent on the (expected) situation on the labour market. However, studies show that on an aggregated level the labour market position of low educated in time is worsening (OECD, 2010). This stimulates governments to invest in educational programs and stimulate educational participation of youth to the highest reachable level possible. We assume that the effectiveness and efficiency of those programs depends for a large part on the regional circumstances and the regional labour market in the sense that worse regional economic circumstances or a particular employment structure would stimulate low educated school participants to continue schooling. That would make a case for more regional differences in a policy approach to enhance the economic position of low educated. The question is, firstly, how strong regional circumstances function as a pull-factor for low educated graduates to enter the labour market and secondly whether they influence the success of transitions that low educated can make.

Explaining the socioeconomic position of low educated persons is not easy considering the overwhelming economic and sociological literature. Several determinants coming from even so many theoretical frameworks explain the (persistence) of the economic position of low educated. In general we can distinguish between individual-, socio-cultural- and (inter)generational aspects by which the socioeconomic position is explained by family background and processes like social and biographical reproduction (van Doorn, Pop & Wolbers, 2011; Tieben & Wolbers, 2010; Gesthuizen & Scheepers, 2010; Breen & Johnsson, 2000); institutional and political aspects by which rules, regulations and welfare arrangements hinder low educated from moving upwards into society p(Traag, van der Valk, van der Velden, de Vries & Wolbers, 2005; Gangl, 2006; Wolbers, 2007); organizational aspects by which quality of schools and school environment determines whether low educated will be successful in their career (Holter & Bruinsma, 2010; Oberon, 2008) and last but not least labour market aspects by which the socioeconomic position is the outcome of market processes.

In this paper we focus on this last issue and try to explain regional variation in transitions that low educated graduates make by looking at regional labour market characteristics. We focus on three possible transitions. First we look at the choice between continuing education versus entering the labour market. Secondly we analyze the chance to get a job versus becoming unemployed. Finally we research the quality of the job in terms of wages of low educated young workers.

The central question is whether there is a significant impact of regional circumstances in explaining variations in transitions made by low educated school leavers. We do not only look at

their single effect, but also to their relative strength compared to other relevant aspects explaining these transitions. To answer this question, we use a dataset of graduates from the Research Centre for Education and the Labour Market (ROA) for the period of 1996-2008 complemented by data from Statistics Netherlands (CBS).

In section 2 we describe the theoretical background and develop several hypotheses. In section 3 we will describe the dataset and the adjustments that we made. In section 4 we will present the results of our model estimations followed by some concluding remarks in section 5. Briefly we find that regional factors have an impact on the decision to (not) continue education, the chance to get a job as well as on variation in wages of low educated graduates. However, they are not of main importance compared to other factors we take along.

2. Theoretical background

Several studies have confirmed that especially low-educated people are vulnerable because of a lower labour force participation, lower wages and bad job circumstances (e.g. Gesthuizen & Scheepers, 2010; Layte, Maitre, Nolan & Whelan, 2001; Tsakloglou & Papadopoulos, 2002; Muffels & Fouarge, 2004). Consequently, in most modern western economies the policy aim is to upgrade the labour force by means of stimulating school participants to continue education to the highest possible level. A well-educated and well trained labour force is considered to be essential for the social- and economic well-being of countries (OECD, 2010: 28). It pushes innovation and stimulates economic growth while on the other hand skill biased technology change demands an upgrading of skills and competencies of the labour force. When low educated have a bad position on the labour market this, according to this line of reasoning, is due to a shortage in skills in relation to the demand and the occupational structure of the labour market. Continuing education would be the only solution to anticipate on changing demand.

There is also an opposite explanation. Although low skilled jobs decline over the last decades, recent developments show that these declines have been in basic cognitive tasks which can now be computerized and exported to other countries. In that sense the labour market is polarizing indicating that the share of manually- and elementary jobs on the one hand and higher- and scientific jobs on the other hand is staying constant or is even rising, while the share of low- and medium skilled jobs is declining (e.g. Autor, Katz & Kearney, 2006; Autor, Levy & Murnane, 2003; Spitz-Oener, 2006; Goos & Manning, 2007). This development is well documented in western economies. For the Netherlands a recent study shows that although the number of low educated persons is declining since years, the number of elementary skilled jobs stays rather stable (Josten, 2010). That, in spite of the developments in the changing levels of jobs, the position of low educated is worsening, is according to this reasoning attributed to the overeducation and displacement effects of low skilled by medium- and high skilled (Gesthuizen &

Scheepers, 2010; Hensen, de Vries & Cörvers, 2009; de Beer, 2006) . Both explanations are an illustration of the underlying theoretical debate between the productive aspects of education as is assumed in the Human Capital Theory from Becker (1964) or the distributive aspects of education which is the core of among others the Job Competition Theory from Thurow (1975). Nevertheless for the economic position of low educated this discussion highlights several relevant aspects in studying the regional labour market impacts on the economic position of low educated, from the spatial development of the employment structure and regional unemployment to the interaction effects with other groups on the regional labour market.

Concerning educational characteristics, there is an overwhelming evidence that investment in education leads to better job opportunities and higher wages (e.g. Broersma, Edzes & van Dijk, 2010; Minne, van der Steeg & Wibbink ,2007; Psacharopoulus & Patrinos, 2002; Groot & Maassen van den Brink, 2003; Gesthuizen & Scheepers, 2010). In general, we would expect that school participants continue schooling for as long as their expected rate of return from further investments in schooling would out weight the returns they receive on the labour market. Because regional differences in private returns on education exist (Broersma et al., 2010) we would expect regional differences in the choices of low educated graduates to continue schooling, mainly influenced by the demand for low skilled and the unemployment level at a regional scale. A high number of elementary jobs would pull low educated to the labour market where high unemployment would stimulate continuing schooling.

When it comes to job opportunities, the chance to get a job and the earned wages, we especially focus on the interaction effects with higher educated. First the higher educated are more concentrated in certain regional labour markets such as urban en population dense areas, than lower educated are. This makes that mutual relations are a typical regional characteristic and we would expect regional differences in this respect. Second the theoretical effect of the presence of higher educated on job opportunities for lower educated is an ongoing dispute. On the one hand high shares of higher educated would improve regional productivity of low educated (productivity spill over) which could at the end lead to employment effects from which low educated could benefit (Broersma et al., 2010; Moretti, 2004a; 2004b). Beside productivity spill over this effect could also be reached by consumption spill overs (Broersma et al., 2010; Suedekum, 2006; Canton, 2009). On the other hand higher educated could substitute low educated especially when there is an oversupply in relation to the demand on the local labour market (Gesthuizen & Wolbers, 2010).

To investigate the effects of regional circumstances we control for characteristics from which we know from the literature that they influence the educational choices, transition behaviour and economic outcomes like gender, ethnicity, age and field of study (see for instance Tieben & Wolbers, 2010; van der Meer, 2008; Traag et al., 2005), the effect of opinions and satisfaction with the study (e.g. Oberon, 2008; Holter & Bruinsma, 2010; ROA, 2010), job characteristics (e.g.

Nordin, Persson & Rooth, 2010; van der Meer & Glebbeek 2002) , job mobility (e.g. Sjaastad, 1962; Hunt & Kau, 1985; Borjas, Bronars & Trejo, 1992) and firm size (Broersma et al, 2010; Canton, 2009).

3. Data and method

Dataset used

For this research we use a dataset from the Research Centre for Education and the Labour Market (**ROA**). The dataset is based on an extended survey under graduates in the Netherlands approximately 18 months after finalizing their education. We have data from 1996-2008. With the survey, data on demographics, followed education, students' opinions and information about the actual situation of the graduate (continue to higher education or work situation) is gathered on a cross-sectional base.

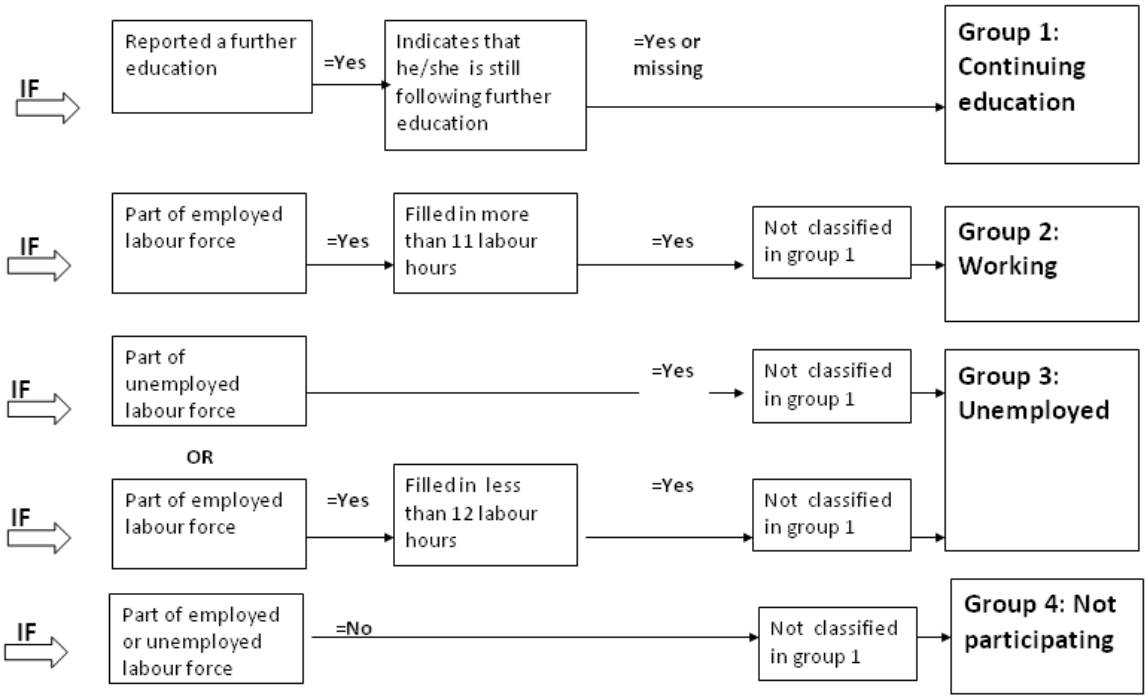
Cleaning the data

As we focus on the low educated graduates, we selected respondents who have graduated in pre-vocational secondary education (VMBO) or in the first two levels of secondary vocational education (MBO). Within the Netherlands, pre-vocational secondary education (VMBO) is the lowest level of secondary education[1]. Other secondary levels of education are senior general secondary education (HAVO) and pre-university education (VWO). Secondary vocational education (MBO) is a post-secondary track and access is possible with a diploma on at least pre-vocational secondary education (VMBO) level. Secondary vocational education (MBO) offers vocational training in various fields. There are two main variants, being Vocational training (Beroepsopleidende Leerweg; BOL) and Apprenticeship training (Beroepsbegeleidende Leerweg; BBL) and four educational levels (1 to 4). A figure showing the whole Dutch educational system including the higher- and lower tracks can be found in
Appendix **1** (Based on Tieben & Wolbers, 2010).

We selected all graduates between the age of 15 and 30. Based on the information given by the respondents, we have classified them into one of four groups. First a group who is participating in further education 1,5 year after graduation. Second a group that is working 1,5 year after graduation. The third group is unemployed 1,5 year after graduation. The fourth group consists of persons who cannot be classified in the above categories and are assumed not to participate. Figure 1 shows a summarizing flowchart which is the basis for the group division.

[1] Except for special education

Figure 1 Classification in groups



To detect outliers based on salary, we checked the wages within our group of working graduates. Therefore we set a boundary on 75% of the minimum wage per age per year. Working respondents with a wage per hour below this barrier are deleted. Besides, we deleted workers with a wage exceeding 12x the minimum wage per age per year (based on Canton, 2009).

Variables in the dataset

The dataset contains information on basic demographics, field of education and level of education. Furthermore it contains information on educational experiences of respondents, like their satisfaction with education[2] and grades for several specific aspects of the education[3]. Regarding the group of working respondents, our dataset includes several job- and company characteristics. We include this information in different steps of our analyses to control for their effect. We also have locational information of the respondent on different levels (education, residence and sometimes job) which we use to link regional data.

[2] Information regarding satisfaction is not available for all fields of study. Satisfaction is measured by the question whether graduates would choose the same education, a different education or would choose not to study at all when they were able to start over again.

[3] Only available for VMBO. Measured by six propositions regarding: content of subjects, way of teaching, amount of practice classes, school ambiance, study accompaniment and preparation for further education. The propositions are graded by graduates on a 5-point scale.

Regional variables

Because of our interest in the regional component, we searched in our dataset for the most specific, complete and reliable geographical location for performing the different analyses. For our first two analyses regarding the chance to (dis)continue education and the chance to find a job, we use the RBA-classification[4] of the place of residence as base for regional data. This is the most detailed level regarding the location directly after graduation in the dataset which is still reliable for analysis. However, for our analysis on wages of working respondents, we have more detailed information regarding the job location available. Therefore, for this analysis, we will use the Nuts-3 level[5] of the job location as base for analysis.

Because we are especially interested in the underlying causes of regional differences, we prefer socioeconomic data over including regional dummies in the model. We collected regional data from statistics Netherlands for the period of 1996-2008. All kind of socioeconomic data on the Nuts-3 level is gathered and recalculated on the RBA-level[6].

Modeling technique

In order to select a relevant set of explanatory regional variables, we controlled for multicollinearity issues between the independents by checking correlations and inspecting the Verification of Inflation Factors (VIF) of the model (e.g. Hair, Black, Babin, Anderson & Tatham, 2006)[7]. Finally we have chosen for a combination of regional variables. To measure the effect of unemployment, we include the percentage of unemployment under young people (15-25). Population density is included to measure urbanity. The number of working people with an elementary or lower profession is added as it is an indication of the total supply of labour for low educated. Finally we include economic growth as we are interested in the effect of economic conjuncture on the position of low educated graduates.

Because of our interest in interaction effects between high- and low educated people, we calculated the oversupply of medium educated by dividing the percentage of working people with a medium education by the percentage of working people with a medium job. We also computed the oversupply of higher educated with this formula. Within this context we also take along the percentage of higher educated living within the area. All data regarding the labour force is collected on level of residence and not at the level of work location as we do not have this information directly available on the latter. As we assume that commuting is not a big issue within this level of aggregation (resp. RBA and Nuts-3 level), we find level of residence to be an

[4] The RBA (Regionale Bureaus Arbeidsvoorziening) area is a classification of the Netherlands originating from the 1990's. It divides the Netherlands in 18 regions and is a summary of labour market areas.

[5] The Nuts-3 regions are 40 stable areas in the Netherlands, originally formed in 1971 based on a nodal classifying principle; each with a central core and a surrounding area.

[6] Regional data is most of times not available on the RBA-level. We gathered all the information per year on Nuts-3 level and weighted the data based on the number of inhabitants of the Nuts-3 regions within the RBA.

[7] To check this, we estimated possible logistic models as a linear regression model, considering our dependent variable 'choice to continue in further education' as a scale variable.

appropriate alternative. Appendix 2 and Appendix 3 show the average values per RBA-region and per Nuts-3 region on the regional variables we include in the model.

In the first analysis we model whether there are regional differences between low-educated graduates who choose to (not) continue in further education. We perform a binary logistic regression analysis with the choice to (not) continue in further education as a dependent variable, being 1 (yes) or 0 (no), based on the group division (Figure 1) we have made. As explanatory variables we include regional data on the RBA-level and control for demographic- and educational differences. In a second and third phase we add respectively satisfaction with education and opinions towards education to research in how far they deliver an additional effect in explaining the graduates' choice. In the second analysis we make a selection of school leavers who decide to enter the labour market and analyze whether the chance to get a job (versus getting unemployed) can be explained by regional differences. We perform a binary logistic regression with being in a job equal to 1, and not being in a job equal to 0, again based on the group division (Figure 1) we have made. We use the same explanatory variables as we did in the first analyses. Besides we also include effects indicating the presence of higher educated to see whether they influence the job chances of lower educated. Our third analysis looks into regional differences in wage between low educated graduates who are classified as working (Figure 1). We perform an Ordinary Least Squares (OLS) regression analysis[8]. The dependent variable in our model is hourly wage per worker. In the base model we include regional characteristics on the Nuts-3 level and control for demographics, educational differences and possible interaction with higher educated people. In next phases we control for job- and company characteristics.

Results

Decision to continue in further education

In our first analysis we perform a binary logistic regression analysis on the decision to (dis)continue education. The descriptives for this analysis can be found in Appendix 4. As we observe an obvious difference between pre-vocational secondary education (VMBO)- and secondary vocational education (MBO) graduates in the decision to (dis)continue in further

[8] In an attempt to correct for selection bias of the working group, we also performed a Heckman selection modeling procedure. In the first stage we estimated a probit model with work (1) or not work (0) as dependent and with inclusion of demographics, education type, regional data and satisfaction as explanatory variables. In the second stage we tried to explain wage differences and excluded satisfaction as it is not correlated to wage. We included the same demographic-, educational and regional variables. On top of that we added some job- and company characteristics. As the rho was not significant and the results were comparable to normal OLS regression, we have chosen to present the results of normal OLS regression analysis.

education (Appendix 4)[9], we choose to split up both education levels in modeling the choice to (dis)continue education. The results of the binary logistic models are depicted in Table 1.

When we look at the base model (M1), we find an influence of the regional indicators we included on the choice to (dis)continue education. For pre-vocational secondary education (VMBO), we find according to our expectations, that graduates continue education more often when regional unemployment among young people is higher. However, for secondary vocational education (MBO) graduates we do not observe this effect. We might explain this by the labour que theory of Thurow as higher educated graduates will have a better competitive position compared to lower educated which makes it more necessary for the lowest educated to continue in education instead of getting unemployed within worse economic circumstances. Instead, for secondary vocational education (MBO), we do find a significantly negative relation regarding economic growth, indicating that respondents tend to discontinue their education more often when economic perspectives are better. Concerning this issue, we do not find an effect for pre-vocational secondary education (VMBO). We find for both education levels that graduates discontinue their education more often when the number of people working in elementary- and lower jobs in the region is high; a higher supply of lower jobs makes it attractive to discontinue education and functions like a pull-factor, in line with our expectations. In addition, we can observe especially for pre-vocational secondary education (VMBO), a significantly negative effect with population density; in more urban regions low educated graduates decide more often to discontinue education. Concerning the control factors we included, we can observe from Table 1 that continuing education strongly declines with age. Besides, during the years more low educated graduates decide to continue education. A more general education stimulates continuing in further education.

In M2 we extend the model by including respondent's satisfaction. Compared to the regional effects, satisfaction turns out to be more important in explaining the choice to continue education when we look at the Wald-statistic; people who are more positive towards their study tend to continue more often in further education. For secondary vocational education (MBO), population density is no longer significant.

[9] Compared to secondary vocational education (MBO) graduates, pre-vocational secondary education (VMBO) graduates are graduated on a lower level in the educational system.

Table 1 Modeling results binary logistic regression choice to (dis)continue education

	Pre-vocational secondary education (VMBO)									Secondary vocational education (MBO)					
	M1			M2			M3			M1			M2		
	Unst. B	Wald		Unst. B	Wald		Unst. B	Wald		Unst. B	Wald		Unst. B	Wald	
(Constant)	-63,43	15,06	***	-42,658	6,419	**	-433,83	61,60	***	-239,26	475,15	***	-242,60	476,81	***
Gender=female[1]	-0,07	1,49		-,123	4,489	**	-0,22	7,07	***	-0,31	42,94	***	-0,30	41,15	***
Age	-0,66	373,74	***	-,659	361,563	***	-0,53	90,16	***	-0,17	253,63	***	-0,17	258,21	***
Immigrant[2]	0,26	10,39	***	,299	13,540	***	0,41	6,16	**	0,25	18,05	***	0,28	21,02	***
Year graduated	0,04	22,13	***	,028	10,833	***	0,22	64,94	***	0,12	489,97	***	0,12	491,00	***
Apprenticeship training (BBL)[3]										-0,65	221,43	***	-0,66	225,39	***
Secondary vocational education (MBO) level 1[4]										-0,10	2,88	*	-0,04	0,41	
Sector of studies[5]=agriculture	0,14	2,89	*	,093	1,147		-0,26	1,61		-0,21	10,62	***	-0,18	7,10	***
Sector of studies[5]=healthcare	-0,13	1,63		-,156	2,328		-0,13	0,32		0,31	18,21	***	0,31	18,94	***
Sector of studies[5]=economics	-0,08	0,71		-,098	,943		-0,40	3,39	*	-0,14	6,81	***	-0,12	4,95	**
Sector of studies[5]=general	0,86	89,35	***	,764	67,481	***	0,14	0,41							
Population density per M[2]	-0,19	9,84	***	-,185	8,926	***	-0,13	2,64		-0,09	2,73	*	-0,09	2,55	
Percentage economic growth	0,28	0,07		1,029	,862		4,35	6,77	***	-2,26	7,22	***	-2,36	7,74	***
Percentage unemployed 15-25	4,46	28,33	***	4,350	25,924	***	4,78	13,04	***	0,80	2,04		0,83	2,15	
Number of working people with an elem. or lower job	-0,18	10,27	***	-,165	8,019	***	-0,13	2,18		-0,10	4,44	**	-0,10	4,92	**
Satisfaction: same education[6]				1,028	346,141	***	0,39	16,86	***				0,29	41,38	***
Satisfaction: not study				-,919	24,620	***							-0,87	98,38	***
Grade: content of subjects							-0,04	0,34							
Grade: way of teaching							0,13	5,99	***						
Grade: amount of practice classes							-0,19	21,41	***						
Grade: ambiance school							-0,08	3,39	*						
Grade: study accompaniment							0,01	0,02							
Grade: preparation for further education							0,27	41,12	***						
DF	12			14			19			13			15		
total N	18263			18263			11836			13030			13030		
Chi square	694,328		***	1091,495		***	568,07		***	1455,37		***	1702,73		***

***p<0,01 **p<0,05 *p<0,1

Referents: [1] Male, [2] Native, [3] Vocational training (BOL), [4] Level 2, [5] Engineering, [6] Satisfaction: would have chosen different education

For pre-vocational secondary education (VMBO) we once again extend the model to control for students' opinions towards different aspects of the education of graduation (measured in grades; M3). Because we have this information over a limited time period the model is now restricted to the period of 2002 to 2008 which reduces the total N (Table 1; M3). We find some of the grades to be even more important than overall satisfaction in explaining the choice to (dis)continue education. Low educated graduates who are more positive about preparation for further education choose more often to do so. Moreover we find that graduates who are more positive about the amount of practice classes discontinue their education more often after finalizing pre-vocational secondary education (VMBO), while they are stimulated to continue education when they like the way of teaching. Compared to the previous models, the regional effects show some dissimilarity. Population density and the number of working people with an elementary or lower job are no longer significant, while there is now a positive relation between economic growth and the decision to continue education for pre-vocational secondary education (VMBO) [10].

Summarizing, based on the modeling outcomes, we find that labour market characteristics seem to affect educational choices. The significant findings are in the expected direction. When labour demand is higher (within good economic circumstances), graduates more often choose to discontinue education. However, worse economic circumstances (like unemployment) stimulate to lengthen study time.
However, based on the Wald statistic, we find that, compared to some of the control variables we include, the impact of regional labour market indicators in explaining the choice to (dis)continue education is not of main importance, especially for secondary vocational education (MBO). Other control variables like age, year trend, education and satisfaction are more relevant in explaining the decision to continue in further education for lower educated graduates. Especially for secondary vocational education (MBO) the regional effects are limited. Furthermore the regional effects show dissimilarities when we look at a smaller time period (M3).

The chance to get a job
In our second analysis we focus on the chance to get a job. The descriptives for this analysis can be found in Appendix 5. The results of the binary logistic models are presented in Table 2.
We find a significant impact for most of the regional indicators we include in the first stage (M4). Regional economic growth increases the chance for low educated graduates to get a job while on the other hand regional unemployment reduces their chances for success. Both effects are constant in all the three estimated models (Table 2). For population density we find a less important but significant effect in a positive direction, indicating that urbanity increases the chance to find a job. For the number of elementary and lower jobs we do not observe an effect.

[10] By adding satisfaction- and opinion variables to the model, the number of cases drops which leads to a little shift in the regional division. Besides, the model is now based on a smaller and more recent time period.

Concerning the control factors we include, we find a significant negative sign for women and immigrants on the chance of being in a job. Concerning education, we find a positive effect of education level and a more work oriented study direction (apprenticeship training) on the chances to get a job.

Table 2 Modeling results binary logistic regression chance to get a job

	M4			M5			M6		
	Unst. B	**Wald**		**Unst. B**	**Wald**		**Unst. B**	**Wald**	
(Constant)	58,419	5,867	**	63,864	7,029	***	128,779	12,665	***
Gender=female[1]	-,506	29,117	***	-,505	28,987	***	-,516	29,998	***
Age	-,025	1,544		-,029	2,059		-,034	2,752	*
Immigrant[2]	-1,125	113,077	***	-1,094	106,201	***	-1,096	104,936	***
Year graduated	0,04	22,13	***	-,031	6,459	**	-,063	11,615	***
Vocational training (BOL)[3]	,526	18,475	***	,547	19,841	***	,571	21,514	***
Apprenticeship training (BBL)[3]	1,375	83,181	***	1,361	81,101	***	1,400	84,946	***
Secondary vocational education (MBO) level 1[4]	-,856	48,964	***	-,861	48,659	***	-,810	41,937	***
Sector of studies[5]=agriculture	-,483	12,382	***	-,512	13,859	***	-,515	13,543	***
Sector of studies[5]=healthcare	-,332	4,669	**	-,325	4,465	**	-,343	4,922	**
Sector of studies[5]=economics	-,199	2,418		-,209	2,656		-,225	3,067	*
Sector of studies[5]=general	,469	2,730	*	,483	2,902	*	,486	2,924	*
Population density per m²	,198	3,079	*	,194	2,959	*	-,365	5,931	**
Percentage economic growth	8,044	21,519	***	8,171	22,176	***	7,909	19,926	***
Percentage unemployed 15-25	-7,376	42,052	***	-7,366	41,880	***	-7,089	35,000	***
Number of working people with an elem. or lower job	,061	,402		,067	,487		,111	1,431	
Satisfaction: same education[6]				,483	31,456	***	,476	30,283	***
Satisfaction: not study				,303	4,134	**	,279	3,481	*
Percentage higher educated							7,278	25,708	***
Oversupply medium educated							,226	,037	
Oversupply higher educated							-1,042	1,163	
DF	15			17			20		
Total N	8411			8411			8411		
Chi square	542,242		***	572,826		***	607,654		***

***p<0,01 **p<0,05 *p<0,1

Referents: [1] Male, [2] Native, [3] Pre-vocational secondary education (VMBO), [4] Level 2, [5] Engineering, [6] Satisfaction: would have chosen different education

When we extend the model with respondents' satisfaction with education (M5), the regional effects are hardly changed. Satisfaction in itself contributes significantly to the model: young low educated graduates who a more satisfied with their education have a higher chance to get a job. This result suggests a reversed causality. Satisfaction might in this sense be a consequence of finding a job. The strength of the satisfaction effect is comparable to the effect of regional characteristics in this issue.

In the final stage we add interaction with higher educated to the model (M6). We find a strong positive relation between the share of higher educated in a region and the chances for lower educated graduates to find a job which suggests productivity or consumption spill overs. We do not find an indication for substitution effects as the effect of oversupply of higher educated is not significant.

In sum we find indications that regional differences do affect job chances. Higher unemployment deteriorates, while economic growth increases job chances. In addition, the presence of higher educated in an area seems to stimulate job chances for lower educated. However, we can not find proof for negative interaction effects to exist. Despite the regional effects we encounter, some controlling variables on the educational- and individual level are more important in explaining the chance to get a job (when we look at Wald statistics).

Wage of working low educated graduates

In our third analysis we look at the hourly wages of the low educated graduates who managed to get a job and analyze the relevance of regional factors in explaining wage differences. We transformed wage per hour to the natural logarithm to correct for normality issues and checked for heteroscedasticity[11]. Appendix 6 shows the descriptives of the group working graduates. The results of the models can be found in table 3.

[11] We also estimated OLS with robust standard errors.

Table 3 Modeling results OLS regression wage of low educated

	M7		M8		M9		M10		M11		M12	
	St. B		**St. B**		**St. B**		**St. B**		**St. B**		**St. B**	
(Constant)	-64,045	***	-68,301	***	-72,064	***	-70,365	***	-68,638	***	-69,643	***
Gender=female[1]	-,144	***	-,146	***	-,138	***	-,135	***	-,134	***	-,106	***
Age	,404	***	,407	***	,393	***	,380	***	,379	***	,365	***
Immigrant[2]	,005		,004		,007		,008		,010		,008	
Year graduated	,212	***	,228	***	,240	***	,235	***	,229	***	,232	***
Vocational training (BOL)[3]	,252	***	,254	***	,238	***	,246	***	,244	***	,232	***
Apprenticeship training (BBL)[3]	,308	***	,309	***	,289	***	,304	***	,302	***	,286	***
Sector of studies[5]=agriculture	-,110	***	-,113	***	-,106	***	-,091	***	-,102	***	-,101	***
Sector of studies[5]=healthcare	-,003		-,001		-,002		-,009		-,004		-,039	**
Sector of studies[5]=economics	-,060	***	-,056	***	-,053	***	-,065	***	-,061	***	-,043	**
Sector of studies[5]=general	,001		,003		,002		,003		,005		,001	
Secondary vocational education (MBO) level 1[4]	-,029	**	-,031	***	-,020	*	-,026	**	-,028	**	-,035	***
Population density per M2	,070	***	,077	***	,073	***	,073	***	,079	***	,075	***
Economic growth	,013		,014		,018		,011		,009		,012	
Percentage unemployed 15-25	-,063	***	-,057	***	-,056	***	-,057	***	-,055	***	-,054	***
Number of elementary or lower job	-,008		-,008		-,007		-,011		-,010		-,012	
Oversupply medium educated			-,038	***	-,035	***	-,038	***	-,038	***	-,038	***
Oversupply higher educated			-,038	**	-,031	*	-,032	**	-,022		-,022	
Percentage higher educated			-,013		-,009		-,015		-,026		-,023	
Job is on higher level [6]					,057	***	,056	***	,056	***	,046	***
Job is on lower level [6]					-,014		-,018		-,019		-,018	
Job only with own specific education [7]					,027	**	,032	**	,033	***	,014	
Unemployed during entry period[8]					-,063	***	-,062	***	-,062	***	-,070	***
Level of job: elementary[9]					,009		,001		,004		,002	
Level of job: medium of higher[9]					,046	***	,046	***	,045	***	,026	**
Size of company							,123	***	,123	***	,083	***
Mobility: not working in same RBA as education[10]									,045	***	,037	***
Agriculture and fishing[11]											,036	***
Production of electricity./gas/water[11]											,011	
Mining[11]											-,008	
Construction[11]											,046	***
Reparation of consumer articles[11]											-,127	***
Hotel and catering industry[11]											,018	
Mobility/storage/communication[11]											,071	***
Financial institutions[11]											,018	
Trading estate/rent estate/business serv[11]											,037	***
Education[11]											-,003	
Heatlhcare[11]											,100	***
Environmental/culture/recreation[11]											,002	
Public management[11]											,037	***
Adj. R2	,431		,432		,445		,459		,461		,499	
DF	15		18		24		25		26		37	
Total N	4432		4432		4432		4432		4432		4432	
F	224,431	***	188,635	***	149,253	***	151,640	***	146,759	***	114,370	***

***p<0,01 **p<0,05 *p<0,1
Referents: [1] Male, [2] Native, [3] Pre-vocational secondary education (VMBO), [4] Level 2, [5] Engineering, [6] Job is on same level, [7] Job is on other direction, [8] Not unemployed during entry, [9] Level of job: lower, [10] Working in same RBA as education, [11] Industry

The base model (M1) contains the same explanatory variables as we use in the other analyses. We find the strongest effects for demographic- and educational related control variables in explaining wage differences for low educated graduates. Being a man, having a higher age and obtaining a higher education level significantly increases the hourly wage. Although not of main importance compared to some control factors in the model, we find a significant contribution of some of the included labour market effects. Within densely populated regions, wages for low educated graduates are significantly higher. We find that wages of low educated graduates are significantly lower in regions with more unemployment under young people. However, economic growth and the number of elementary- and lower jobs do not contribute significantly to the model.

In the second model M2 we add interaction with higher educated. Although we find a positive relation between the share of higher educated in a region and the chances for work for lower educated (Table 2), we do not find a significant effect between the share of higher educated in a region and the hourly wages of low educated. We do find a significantly negative effect between the oversupply of higher educated and hourly wage, especially for the oversupply of medium educated. When there is more oversupply of people with a higher education level, wages of low educated workers are lower. It suggests that lower educated have to deal with lower paid jobs because higher educated people take over the better jobs. The adjusted R-squared of the total model is slightly improved compared to the base model.

In the next phases we extend the model with respectively job characteristics, company size, mobility and company sectors to see whether controlling for these issues has an impact on the regional effects. Almost all of the controls we add deliver a significant contribution to the model, but do not have an effect on the contribution of the regional variables already in the model. The strength of the job effects is comparable to the effect of regional indicators in explaining hourly wage (M9). Wage increases with job level and job match, while people who have been unemployed during the entry period earn significantly less. The effect of company size in explaining wage differences is quite relevant and stronger than the effects of job- and regional characteristics (M10). Within bigger companies, low educated workers earn significantly more. This finding supports the conclusions of Canton (2009) and Broersma et al. (2010) who conclude that within company effects are of more importance than regional effects in explaining wage differences. Besides that, mobility seems to be lucrative (M11). We find that people who work in the same region as where they have studied earn significantly less compared to people who work in a different RBA-region. Also this can be a matter of reverse causality as we can expect people to move out of places with lower wages and move to places with higher wages. The strength of this effect is comparable to the effects of job- and regional characteristics. Also company sector significantly contributes to the model. According to our findings (M12), especially people working

in healthcare earn more, while people working in reparation of consumer articles and trade earn significantly less compared to people working in industry.

Overall it can be concluded that wage differences between lower educated working graduates can be explained by several indicators. Although demographics and education related characteristics are of most importance in explaining wage differences, we also found evidence for regional effects to play a part in explaining wage differences. The regional effects are constant and not influenced by the addition of extra control variables. The strength of the regional effect is comparable to the effect of job- and company characteristics. Based on their individual strength in the model, within company effects seem to out weight regional labour market effects in explaining wage differences.

Summary and conclusion

In the light of the worsening position of lower educated on the labour market, the central question of this research was to investigate the impact of regional circumstances in explaining variations in transitions made by low educated school graduates. We focused on their educational decisions, the chances to find a job and the wage outcomes for those who discontinue education and find a job.

Concerning the choice to continue education, we found that regional factors influence the probability to continue education for young low educated graduates. Within better economic circumstances with more potential jobs and a lower unemployment, low educated graduates choose more often to discontinue education. However, we found other factors to be of more relevance in explaining graduates' choices. The choice to continue in education is more grounded in educational differences. Graduates in a more work oriented study sector, choose more often to enter the labour market, compared to those who graduated in a more generally based education. Even more important is the relation between satisfaction with education and the choice to continue in education. Focusing on the attractiveness of education might be a useful way in influencing students' behavior.

When we look at the job chances and the earned wages of low educated we find an impact of regional characteristics within this context. Regional unemployment deteriorates, while economic growth stimulates the chance to find a job. Also urbanity seems to have a positive effect on job chances. In addition we find that job chances for low educated are better in areas where a lot of high educated people live. We do not find evidence for displacement effects of an oversupply of higher educated on job chances of low educated. From the included effects, education related- and individual factors seem to be most important indicator in finding a job.

Concerning the wages of young educated workers, we also find that regional labour market characteristics have an effect on the economic position of low educated workers. Regional unemployment decreases, while urbanity increased wages of low educated workers. We find

positive production externalities within firms for low educated by means of the positive relation between wage and firm size. However, on the regional labour market we find a negative interaction effect between high- and low educated, indicating that low educated are suppressed into lower paid jobs when there is a relative oversupply of higher educated. This is an interesting aspect for further analysis, especially as we find that earned wages are positively influenced by job mobility. Stimulating job mobility might be a good way to better match demand and supply on the labour market and thereby improve the economic position of the lower educated. Despite the relevance of the regional aspects described here, we have to mention that the regional effects are out weighted by individual factors, educational aspects and within firm differences, measured by firm size.

Overall we can conclude that regional labour market characteristics are a part of the whole context of determinants and conditions in which decisions are made and economic positions exist. However as their effect is out weighted by other aspects like demographical and educational characteristics we should not overestimate the role of regional diversity for explaining educational choices and economic outcomes in a country like the Netherlands.

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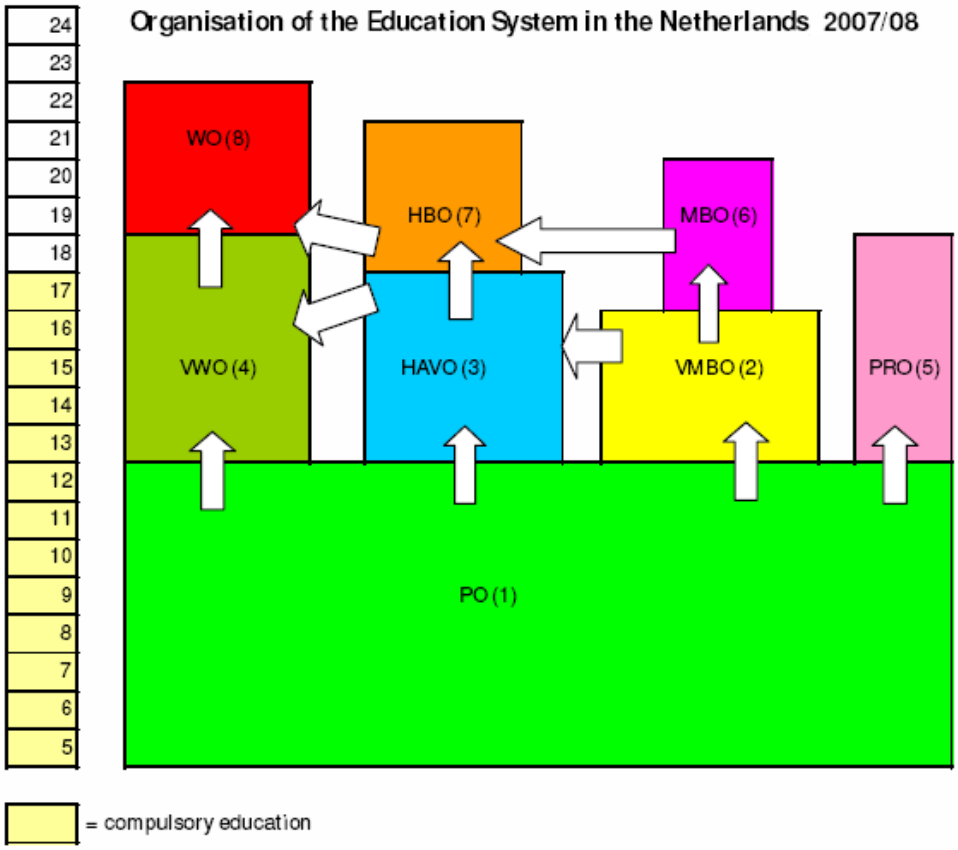
Appendix 1 Educational system in the Netherlands



1 primary education (PO)
2 pre-vocational secondary education (VMBO)
3 senior general secondary education (HAVO)
4 pre-university education (VWO)
5 practical training (PRO)
6 secondary vocational education (MBO): ½-4 yrs
7 higher professional education (HBO-bachelor)
8 university (WO-bachelor + -master)

Source: Ministry of Education, Culture and Science, 2007.

Appendix 2 Average regional values on RBA-level (1996-2008)

RBA	Percentage economic growth	Population density per M2	Percentage unemployed 15-25	Number of working people with elementary/lower job (x100000)
Groningen	3,66%	0,24	15,05%	0,78
Friesland	4,72%	0,19	12,77%	0,88
Drenthe	5,75%	0,18	10,76%	0,67
IJssel-Vecht/Twente	6,00%	0,32	8,07%	1,44
IJssel/Veluwe	5,56%	0,33	6,56%	1,14

Arnhem-Oost Gld./Nijm. Rivierenland	5,34%	0,45	10,99%	1,69
Flevoland	8,89%	0,24	10,99%	0,50
Midden-Nederland	5,79%	0,88	7,74%	1,66
Noord-Holland Noord	5,49%	0,44	7,21%	0,84
Zuidelijk Noord-Holland	4,92%	1,56	11,77%	2,17
Rijnstreek	4,69%	0,96	6,60%	1,02
Haaglanden	5,08%	2,40	9,34%	1,22
Rijnmond	6,20%	1,03	10,62%	2,18
Zeeland	5,68%	0,23	7,88%	0,62
Midden- en West-Brabant	5,30%	0,49	8,47%	1,51
Noordoost-Brabant	6,17%	0,45	5,03%	0,94
Zuidoost-Brabant	6,17%	0,50	8,34%	1,03
Limburg	5,24%	0,53	11,17%	1,66
Total	5,61%	0,67	9,51%	1,41

Source: Statistics Netherlands, own computation.

Appendix 3 Average regional values on Nuts-3 level-level (1996-2008)

Nuts-3	Population density per m²	Percentage economic growth	Percentage unemployed 15-25	Number of working people with elementary/lower job (x100000)	Percentage higher educated	Oversupply medium educated	Oversupply higher educated
Oost-Groningen	0,18	3,27%	13,56%	0,25	12,33%	1,21	0,80
Delfzijl en omgeving	0,19	2,77%	5,56%	0,07	17,62%	1,11	1,09
Overig Groningen	0,29	7,27%	16,11%	0,45	32,55%	1,20	1,04
Noord-Friesland	0,20	4,24%	15,14%	0,44	21,70%	1,16	0,95
Zuidwest-Friesland	0,17	5,20%	16,67%	0,14	16,50%	1,09	1,02
Zuidoost-Friesland	0,18	6,58%	8,70%	0,26	20,73%	1,15	0,91
Noord-Drenthe	0,17	5,71%	9,18%	0,21	25,36%	1,16	0,92
Zuidoost-Drenthe	0,18	7,26%	8,18%	0,27	13,32%	1,16	0,82
Zuidwest-Drenthe	0,18	3,02%	10,64%	0,20	15,47%	1,20	0,84
Noord-Overijssel	0,23	5,28%	5,80%	0,48	21,28%	1,17	0,90
Zuidwest-Overijssel	0,35	6,05%	8,77%	0,21	24,49%	1,22	0,98
Twente	0,41	4,57%	9,93%	0,84	21,53%	1,21	0,90
Veluwe	0,35	5,49%	5,85%	0,87	23,38%	1,19	0,88
Achterhoek	0,25	4,32%	6,30%	0,61	19,55%	1,18	0,91
Arnhem/Nijmegen	0,74	5,01%	10,85%	0,88	32,34%	1,13	0,99
Zuidwest-Gelderland	0,32	6,06%	7,91%	0,36	20,65%	1,10	0,90
Utrecht	0,81	6,28%	8,47%	1,33	36,32%	1,13	0,99
Kop van Noord-Holland	0,33	5,74%	6,07%	0,54	18,08%	1,21	0,85
Alkmaar en omgeving	0,80	5,49%	9,64%	0,29	25,57%	1,19	0,89
IJmond	1,20	4,00%	9,68%	0,24	24,74%	1,15	0,91
Agglomeratie Haarlem	1,67	3,04%	10,15%	0,23	37,73%	1,08	0,98
Zaanstreek	1,33	4,80%	7,57%	0,23	22,35%	1,11	0,92
Groot-Amsterdam	1,61	6,44%	11,68%	1,43	38,18%	1,11	1,04
Het Gooi en Vechtstreek	1,26	4,62%	4,55%	0,25	36,77%	1,16	0,93
Agglomeratie Leiden en Bollenstreek	1,60	3,93%	5,29%	0,53	32,54%	1,19	0,94
Agglomeratie s-Gravenhage	3,12	5,86%	6,74%	0,92	34,88%	1,12	0,97
Delft en Westland	1,29	3,58%	6,62%	0,27	29,11%	1,15	0,91
Oost-Zuid-Holland	0,64	3,89%	6,13%	0,43	26,33%	1,13	0,90
Groot-Rijnmond	1,12	5,81%	10,58%	1,78	24,53%	1,11	0,91

Zuidoost-Zuid-Holland	0,80	4,18%	5,97%	0,54	20,23%	1,17	0,82
Zeeuwsch-Vlaanderen	0,15	5,53%	6,35%	0,17	18,01%	1,09	1,10
Overig Zeeland	0,25	5,39%	5,98%	0,38	21,86%	1,17	0,94
West-Noord-Brabant	0,48	5,73%	6,74%	0,87	23,93%	1,17	0,92
Midden-Noord-Brabant	0,48	4,83%	7,27%	0,62	24,76%	1,13	0,98
Noordoost-Noord-Brabant	0,45	5,72%	3,62%	0,93	25,01%	1,18	0,96
Zuidoost-Noord-Brabant	0,49	6,14%	8,99%	1,02	28,44%	1,20	1,01
Noord-Limburg	0,33	4,31%	6,85%	0,46	18,81%	1,18	0,92
Midden-Limburg	0,34	5,40%	7,93%	0,34	23,50%	1,17	0,97
Zuid-Limburg	0,96	4,98%	12,88%	0,87	24,87%	1,17	0,99
Flevoland	0,23	8,49%	7,82%	0,47	23,13%	1,15	0,89
Total	0,76	5,47%	8,68%	0,83	26,25%	1,15	0,94

Source: Statistics Netherlands, own computation.

Appendix 4 Descriptives of respondents in analysis on continuing education

		Pre-vocational secondary education (VMBO)				Secondary vocational education (MBO)			
		Mean/pct	**Std dev**	**Min**	**Max**	**Mean/pct**	**Std dev**	**Min**	**Max**
Region	*Population density per m²*	0,71	0,49	0,18	2,46	0,61	0,45	0,17	2,46
	Percentage economic growth	5,55%	2,60%	-3,07%	13,13%	5,68%	2,38%	-3,07%	13,13%
	Percentage unemployed 15-25	9,58%	3,48%	1,03%	22,66%	9,40%	3,55%	1,03%	25,05%
	Number of working people with an elementary or lower job(x100000)	1,44	0,57	0,37	2,32	1,36	0,53	0,36	2,32
Demographics	*Age*	17,55	0,67	16	28	20,64	2,18	16	30
	Male	41,57%				54,25%			
	Immigrant	11,94%				12,99%			
Sector of studies	*General*	32,15%							
	Agriculture	31,11%				12,52%			
	Engineering	11,39%				32,36%			
	Economics	10,62%				39,48%			
	Healthcare	14,72%				15,64%			
Level of education	*Level 1*					11,91%			
	Level 2					88,09%			
Category of studies	*Vocational training (BOL)*					58,26%			
	Apprenticeship training (BBL)					41,74%			
Satisfaction with education	*Choose same education*	82,52%				69,21%			
	Choose different education	16,69%				23,09%			
	Not study at all	0,79%				7,70%			
Dependent: Continue education	*Yes continue education*	89,30%				43,42%			
	Total N	18263				13030			

Source: Statistics Netherlands, own computation.

Appendix 5 Descriptives of respondents in analysis on chance to get a job

		Mean/pct	Std dev	Min	Max
Region	*Population density per M²*	0,65	0,47	0,17	2,46

	Percentage economic growth	5,75%	2,39%	-3,07%	13,13%
	Percentage unemployed 15-25	9,26%	3,48%	1,03%	25,05%
	Number of working people with an elementary or lower job(x100000)	139,51	54,15	36,00	232,41
	Percentage high educated	26,31%	5,79%	16,67%	42,08%
	Oversupply medium educated	1,15	0,04	1,07	1,33
	Oversupply higher educated	0,97	0,08	0,80	1,15
Demographics	*Age*	20,43	2,47	16,00	30,00
	Male	52,80%			
	Immigrant	10,26%			
Sector of studies	*General*	2,70%			
	Agriculture	18,30%			
	Engineering	30,72%			
	Economics	34,74%			
	Healthcare	13,54%			
Level of education	*Pre-vocational secondary education (VMBO)*	18,35%			
	Secondary vocational education level 1 (MBO1)	8,68%			
	Secondary vocational education level2 (MBO2)	72,98%			
Category of studies	*Pre-vocational secondary education (VMBO) Vocational training (BOL)*	18,35%			
	Apprenticeship training (BBL)	39,66%			
Satisfaction with education	*Choose same education*	41,99%			
	Choose different education	66,13%			
	Not study at all	24,69%			
Dependent: Chance for work	*Found work*	9,18%			
	Total N	90,74%			
		8411			

Source: Statistics Netherlands, own computation.

Appendix 6 Descriptives of respondents in analysis on earned wages

		Mean/pct	Std dev	Min	Max
Region	*Population density per m2*	0,76	0,54	0,15	3,23
	Percentage economic growth	5,47%	2,99%	-9,31%	28,86%
	Percentage unemployed 15-25	8,68%	4,49%	0,00%	33,33%
	Number of working people with an elementary or lower job(x100000)	0,83	0,48	0,05	1,89
	Percentage high educated	26,25%	6,73%	9,38%	46,63%
	Oversupply medium educated	1,15	0,05	0,91	1,32
	Oversupply higher educated	0,94	0,08	0,63	1,51
Demographics	*Age*	20,14	2,32	16,00	30,00
	Male	51,88%			
	Immigrant	9,27%			
Sector of studies	*General*	1,92%			
	Agriculture	21,18%			
	Engineering	30,99%			

	Economics	34,13%
	Healthcare	11,78%
Level of education	*Pre-vocational secondary education (VMBO)*	22,96%
	Secondary vocational education level 1 (MBO1)	7,13%
	Secondary vocational education level2 (MBO2)	69,91%
Category of studies	*Pre-vocational secondary education (VMBO)*	22,96%
	Vocational training (BOL)	39,88%
	Apprenticeship training (BBL)	37,15%
Job characteristics	*Job is on lower level*	47,33%
	Job is on same level	36,16%
	Job is on higher level	16,51%
	Job only doable with own specific education	48,05%
	Job doable with other or no specific education	51,95%
	Unemployed during entry period	18,52%
	Elementary	9,88%
	Low	60,73%
	Medium	29,07%
	High	0,32%
Size of company	*0-10*	20,64%
	10-100	40,22%
	100 and above	39,14%
Mobility	*Working in other region than education*	34,49%
Company sector	*Agriculture/fishing*	5,73%
	Mineral extraction	0,05%
	Industry	15,38%
	Production of electricity./gas/water	0,29%
	Construction	9,75%
	Reparation of consumer articles and trade	28,96%
	Hotel and catering industry	6,93%
	Mobility/storage/communication	6,86%
	Financial institutions	1,99%
	Trading estate/rent estate/services business	7,20%
	Public management/governmental business/obliged social insurance	5,14%
	Education	0,52%

	Healthcare	7,40%			
	Environmental/culture/recreation and other services	3,81%			
Dependent: Wage	*Wage*	6,25	2,60	1,92	43,34
	Total N	8411			

Source: Statistics Netherlands, own computation.